



WP+ 136P1

CRP-001-CP3

01/03/90

EPP
01/27/90
#4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Rueger et al. Examiner: N. Nutter
Serial No.: 422,699 Group Art Unit: 153
Filed: October 17, 1989 Attorney Docket: CRP-001-CP3
Title: OSTEOGENIC PROTEIN

Honorable Commissioner of Patents and Trademarks
Washington, DC 20231

I hereby certify that this correspondence is being
deposited with the United States Postal Service as
first class mail in an envelope addressed to:
Honorable Commissioner of Patents and Trademarks,
Washington, D.C. 20231 on the date set forth below.

Jan 17, 1990
Date of Signature
and of Mail Deposit

By Edmund R. Pitcher
Edmund R. Pitcher
Registration No. 27,829
Attorney for Applicant

LETTER TO THE OFFICIAL DRAFTSMAN

Dear Sir:

Enclosed is a copy of the Notice of Patent Drawing
Objection in the above-referenced application, and new
drawings, correcting the informalities.

Respectfully submitted,
LAHIVE & COCKFIELD

Edmund R. Pitcher
Edmund R. Pitcher
Attorney for Applicants
Reg. No. 27,829

60 State Street
Boston, MA 02109
(617) 227-7400

Date: 1/17/90

GROUP 153

ATTACHMENT TO
PAPER NUMBER 2

S.N. 422699

NOTICE OF PATENT DRAWINGS OBJECTION

Drawing Corrections and/or new drawings may only be submitted in the manner set forth in the attached letter, "Information on How to Effect Drawing Changes" PTO-1474.

- A. The drawings, filed on 10-17-89, are objected to as informal for reason(s) checked below:

1. Lines Pale.
2. Paper Poor.
3. Numerals Poor.
4. Lines Rough and Blurred.
5. Shade Lines Required.
6. Figures Must be Numbered.
7. Heading Space Required. *Fig. 1A-1* *11 top*
8. Figures Must Not be Connected.
9. Criss-Cross Hatching Objectionable.
10. Double-Line Hatching Objectionable.
11. Parts in Section Must Be Hatched.
12. Solid Black Objectionable.
13. Figure Legends Placed Incorrectly.
14. Mounted Photographs.
15. Extraneous Matter Objectionable.
[37 CFR 1.84 (1)]
16. Paper Undersized; either 8½" x 14", or 21.0 cm. x 29.7 cm. required.
17. Proper A4 Margins Required:
 TOP 2.5 cm. RIGHT 1.5 cm.
 LEFT 2.5 cm. BOTTOM 1.0 cm.
18. Other:
- Fig. legends small must be big
Fig. (1A-1)(3-2) big

- B. The drawings, submitted on 10-17-89, are so informal they cannot be corrected. New drawings are required. Submission of the new drawings MUST be made in accordance with the attached letter.

Cancel!

11/422399

GGAGGTATAGGAGCTCTTCGATTTAGCAAACCAAGGAGTCCGAAGATCTAAGGAGAGC
TGGGGTTTGACTCCGAGAGCTCGAGCAGTCCCCAAGACCTGGTCTTGACTCACGAGTTA
GACTCCACTCAGAGGCTGACTGTCTCAGGGCTACACCTTAAGGGCAGACACTGGGCTC
AACAGACTGCCTTCTATATGGATGAGCCTCACAGGGCAGCCAGTTGGATGGG
TGAGGTTGGCTGTAGACATCAGAAACCAAGTCAAATGCCTCAACCAGTAGAAAATT
CACCAAGCCCAGAGCTAAGGTTGGGACATTAGGTTGGTGTACCCAGGAGCTCAAC
AGTGTCTCTGAGCCCCAGCTCTGCCCCACCCACCATCTCAGTGCTGCTCCTC
TCAAGGCCACAGCTGAGTTGCCAGGGGGCTTCATTATTTTGCTCTGGGAGTAG
GAGGAAGAGAATGAATGTCTCCATGGGTCTTTAGGAATGTGGGAACCTTCCAG
AAGTCTCTATGTTAGTTGTGGGTCACTTGCCCCCTCTGAACCAACTTCCGTAC
TCCGGACAGGATGTGACTGTGAGCTTAGCTTGGGGATCTAATAGTGACTTACAAA
GCCTTTGAGAAGGTGACATTGGAACCAAGGGCTGAGCAGACACAACAAAGATTGAG
GAGGGGATTGCAAGGTGGAGGAACGGCACATGCAAGAGCCTGCGTGGGAGTGAGCTG
GTGTTGGTCAATCAGTTGTCAGAGCACACCGGCCCTGTCAGCAGGCACAGCCTGGG
TGCTCTGAGTATGACAGAGAGGCCCTGGGAAGTTGAGGGAGGAAGACAGGTATGA
CTAGGAAAAAAGCAATCCCTCTGTTGTGGGTGGAAGGAAGGTTGAGTGTGAGAG
AGAGACAAGACAGACAGACAGACACTTCTCAATGTTACAAGTGCTCAGGCCCTGACCC
AATGCTTCCAATTTACGTAGTTCTGGAAACCCCTGTATCATTTCACTACTCAAAGA
AACCTCGGGAGTGTCTCTGAAAGGTATCAGGTTTGACTCTCTGCTGCTCATTT
CTCTTGCTGGTGTGGTGTGGGTCTACGAGTTGAGGGTTGTCATAAGCAGATCTCT
CTGAGAGGGATGAGTGTGTTGGGCCCTCACGAGTTGAGGGTTGTCATAAGCAGATCTCT
TTGAGCAGGGCCTGCACTGGCTTGTGAGGCTGGAGGGGTTGTCATTCCCTTATGG
AATCCAGGCAGATGTAGCATTAAACAACACACGTGTATAAAGAAACCAGTGTCCGCAG
AAGTTCCAGAAAGTATTATGGATAAGACTACATGAGAGAGGAATGGGCATTGGCAC
TCCCTTAGTAGGGCCTTGCTGGGGTAGAAATGAGTTAAGGCAGGTTAGACCCCTGA
ACTGGCTTGAATGGGAAATTACCCCCCAGCCGTTGTGCTTCATTGCTGTTACA
TCACIGCTTAAGATGGAGGAACITTGATGTGTGTTCTTCTCCTCACTGGGCTCT
GCTCTTCACTCCTGTCAAT

;intron=exon

GCAGAGAACAGCAGCAGCAGCACCAGAGGCAGGCCCTGTA

A E N S S S D Q R Q A C

AGAACGACAGCAGCTGTATGTCAGCTCCGAGACCTGGGCTGGCAG

K K H E L Y V S F R D L G W Q

;exon=intron

GTAAGGGCTGGCTGG

GTCGTCTTGGGTGTPGGCCCTCTGGCGTGGCTCCACAGGCAGCAGGGTGTGCTCA
GTCTTGTCTCATCTGCACTGCAAGTAAAGACTCCAGTATCAAGTGGCCTCGCTAGGGAAAG
GTACTGGCTAAGGATACAGGG.....
GGGAGCCAGCATGGGTGATGCCATTATGAGTTATTAGCCTCTGGCAGGTGGGAAAC
CGAGGCATGGAGGTTGTTAAGGTGAACTGCCAGTGTGACCACCTAGTGGGTAGAG
CTGATGATTGCTCACACCGGAGCTCTCTGCGCGTTCTGTCCAGAAGACACAGC
CATGGATGTCCATTAGGATCAGCCAAGCCCCGTTGTGCTTCACTTATTTATTTATGT
TTTTTAGAAATGGGGTCTTGCTCTGCTACCCAGGCTGGGTGAGTGGTGTGATCATAGC
TCACCGCAGCTTGACGCCGTCTCCACTCAGCTACTAAGCTGGACTATAGGCCAAG
ACTATAGACTGGCTCTTCCATTCTTGGGACCATGAGAGGCCACCCATGTTCT
GCCCTGCTGGGCCCTGCTCAGAAGGCATGGTCTGAGGCTTCACTTGGTGTGAG
CCTCGTGGTGGTTCTTCAGCATGGGTTGGATGCTGTGCTCAGGCTCTGCATGGT
TTCCCACACTCTCTCCTCAG

;intron=exon

FIG. 1A-1

17422699

GAATGGATCATCGCCCTGAAGGCTACGCCGCCT
D W I I A P E G Y A A
ACTACTGTGAGGGGGAGTGTGCCTCCCTCTGAACCTACATGAACGCCACCAACCACG
Y Y C E G E C A F P L N S Y M N A T N H
CCATCGTCAGACGCTG
A I V Q T L
;exon=intron

GTGGGTGTACGCCATCTGGGGTGTGGTCACCTGGGCCGGC
AGGCTGCGGGGCCACCAAGATCCTGCTGCCCTCAAGCTGGGCCGTAGTAGATGTCAGCCC
ATTGCCATGTCACTGACTTTGGGGCCCTTGCGCCGTAAAAAAATCAAAAATTGTA
CTTATGACTGGTTGGTATAAGAGGAGTATAATCTCGACCCCTGGAGGTTCACTTATT
CTCCAATTTAAAGTAATAAAGTTGATGGCTCCTTGAGGATGCTTGTAGTATT
GTGGGTGCTGGTACGGTGCCTAACAGCACTGGGCCCTGCTCATTTCAGTAGAGGA
AACAGGTAACAGATGAGAAATTCACTGAGGGCACAGTGATCAGAACGGGCCAGCAG
GATAATGGGATGGAGAGATGAGTGGGGACCCATGGCCATTCAAGTTAAATTCACTG
GGTACCAAGGAAGATTCCATGTGATAATGAGATAACGTGCCAGTCACGGCAGACTCA
GTAGGTGTTATCCTGCTGCCAACAGCAACCATAGTGATAAGAGCTGTTAGGATT
TGTCCCTTTGCTTAGATCCAAGGTTCAAGGACCTGGTTATGAGCTCCCTGTCATGAA
CATCATCTGAGCCTTCCTGCCTACTGATCATCACCCCTGCCCTGAATGCTTCACTGAC
AGAGAGCTCACTACCAAGGACTACCCCTCCTTCATTAGTAATCTGCCCTCCTTT
TTGCCCCCTGCTGTGTTAAGTCTGGAGAAAATCTCATCTATCCCTTCATTGAT
TCTGCTCTTGAGGGCAGGGTTTTGTTCTTGTGTTTTAAGTGTGGTTTC
CAAAGCCCTTGCTCCCTCCTCAATTGAAACCTCAAGCCCTCATGGGATTGAAGGTCC
TTAGGCTGAAACAGAAGAGCTCCCAACCTGTCCTGGCCTGGATGTGCTGTGCTG
TGCCAGTATCCCTGGAAGGTGCCAGGCATGTCCTCCGGCTGCCAGGGACACATCTCT
ATCCTCTCCAACCCCTGCCATGGCCATGGAACAGGAGTGCCATGCCCTGTC
ACCTACTCCATCAGTATTCACCAGAGATCTGCAGGATCAAAGTGAATTCTCAGGGAT
TGTGAAATGATGCGATTGGTGTGCTTAAAGGGGCAACTGTCTCTAGAGAGTCCT
GATGAAATGCTCCAGAGGAAATGAGCTGATGGCTGGAATTGCTTAAATCATTCAAG
GTGGAGCAGGGAGGGTATGGATGTGAAAGAGTTGAAATTGTCATCATAAAATG
TGTAAGGAGCATGCTGGCTATGTCAGCAGTCACAGCCTGGAGGTGGTAACAGAGTGC
GTCACTGATGCTCAAGCCTGGCACCTACAGTGTGAAACAGGAGATCTGCTAACACT
AACAAACAGGACAGTGAATCTCTGGCCCTGTCTGAAACACGGCAGATCTGCTAACACT
GATCTGGTTGGCTGCCGTCAAGTTGAGTTGAGTGGCGGTCTCCCTAGTTGCTTAGT
CCCCGCTATTCCCTATTGCTTACCTCGGTCTATTGCTTATCAGTGACCTCACGAGG
CACTCATAGGATTTGAGTCTATGTCCTCTGCCCCACATCCTCTGTAAGGTGCAGAGAA
GTCCATGAGCAAGATGGAGCACTCTAGTGGGCTCAAGTCAGGGACACTATTCAAGAACATC
TACAGTCACAGGGCAGTCCCCAACAGAGAAATTACCTGGGCTCTGAATGTCGGATCTGGC
CCCCCTCTCCCCACTGTATAATGTGAAAACCTCTATGCTTGTCCCCCTGTCTGCAAA
ACAGGGATAATCCCAAGAACTGAGTTGCTCATGAAAGTGTCTAGAACAGGGAGTGTGCTGG
CTTGGGAGTGTGACCTGCACTGAGTCATTCAATTGCCAGACAGGGATGTTCTTATAGAAA
CGTGGAGGCCAGTTAGAACGACTCACCGCTTCACCAACTGCCCATGTTGGTGTGTT
TTCAG
;intron=exon
GTCCACTTCATCAACCCGAAACGGTGCCAACGCCCTGCTGTGCCACGCAGC
V H F I N P E T V P K P C C A P T Q
TCAATGCCATCTCCGTCTACTTCAGTGCAGCTCAAGTCATCCTGAAGAAATACA
L N A I S V L Y F D D S S N V I L K K Y
GAAACATGGTGGTCCGGGCTGTGGCTGCCACTAGCTCCTCCGAGAATT
R N M V V R A C G C H

FIG. 1A-2

07/422899

10	20	30	40	50	60
GGTGC	GGGCC	GGAGCCC	GGTAGCGC	GATGCACGTG	GCGC
M	H	V	R		
70	80	90	100	110	120
TCACT	CGAGCT	CGGCC	CACAGCT	CTCGT	GGCGCT
S	L	R	A	A	P
130	140	150	160	170	180
CGCTCCG	CCCTGG	CCGACTTC	AGCCTGG	ACAACG	AGGTG
R	S	A	L	A	D
-	-	-	-	-	-
190	200	210	220	230	240
CGCCTCCG	CAGGCC	AGGGAGCGG	GATGCA	CGCGAGA	TCC
R	L	R	S	Q	E
250	260	270	280	290	300
CCCCACCG	CCCGCG	CCCCCAC	CTCCAGGG	CAAGCACA	ACTCGG
P	H	R	P	R	P
310	320	330	340	350	360
GACCTGT	TACAACGCC	CATGGCG	GTGGAGG	AGGGCGG	GGCCAGGG
D	L	Y	N	A	M
370	380	390	400	410	420
TACCCCT	ACAAGGCC	GCTTCA	GTA	CCCAGGG	CCCCCT
Y	P	Y	K	A	V
430	440	450	460	470	480
CATTTCCT	CACCGACGCC	GACATGG	TGAGCT	TCGTCAAC	CTCGTGA
H	F	L	T	D	A
490	500	510	520	530	540
GAATTCTT	CCACCCACG	CTACCACC	ATCGAGAG	TTCCGG	TTGATCTT
E	F	F	H	P	R
550	560	570	580	590	600
GAAGGGGAA	AGCTGT	CACGGCAGCC	GAATTCCG	GATCTAC	AAAGGACTAC
E	G	E	A	V	T
610	620	630	640	650	660
TTCGACA	ATGAGAC	GCTCCGG	ATCAGCG	TTATCAGGT	GCTCCAGGAGC
F	D	N	E	T	F
670	680	690	700	710	720
GAATCGG	ATCTTCC	CTGCTCG	ACAGCCG	TACCC	CTGGGCTGG
E	S	D	L	F	L
730	740	750	760	770	780
GTGTTTG	ACATCACAGC	ACCCAGCA	ACCACTGG	GTGCA	ATCCG
V	F	D	I	T	A
790	800	810	820	830	840
CTGCAG	CTCGGTGG	AGACG	CTGGATGG	GCAGAGC	CATCAAC
L	Q	L	S	V	E
850	860	870	880	890	900
ATTGGGCGG	ACGGGCC	CCAGAAC	AAAGCAG	GCC	CTTC
I	G	R	H	G	P
910	920	930	940	950	960
GAGGTCC	ACTCCG	CAGCATCCGG	TCCACGGG	GAGCAA	ACAGCG
E	V	H	F	R	S
*	*	*	*	*	*
970	980	990	1000	1010	1020
AAGACGCC	CAAGAAC	CCAGGAAG	CCCTGCG	GAACGTGG	CAGAGAAC
K	T	P	K	N	Q
*	*	*	*	*	*

FIG. 1B-1 OP1 CDNA

07/422699

1030 1040 1050 1060 1070 1080
GACCAGAGGCAGGCCTGTAAGAACGACGAGCTGTATGTCAGCTCCGAGACCTGGCTGG
D Q R Q A C K K H E L Y V S F R D L G W
1090 1100 1110 1120 1130 1140
CAGGACTGGATCATCGCCCTGAAGGCTACGCCGCCTACTACTGTGAGGGGGAGTGTGCC
Q D W I I A P E G Y A A Y Y C E G E C A
1150 1160 1170 1180 1190 1200
TTCCCTCTGAACCTCCTACATGAACGCCACCAACCACGCCATCGTCAGACGCTGGTCCAC
F P L N S Y M N A T N H A I V Q T L V H
1210 1220 1230 1240 1250 1260
TTCATCAACCCGGAAACGGTGCCCAAGCCCTGCTGTGCCACGCAGCTCAATGCCATC
F I N P E T V P K P C C A P T Q L N A I
1270 1280 1290 1300 1310 1320
TCCGTCCCTCACTTCGATGACAGCTCCAACGTCACTCTGAAGAAAATACAGAAAATGGTG
S V L Y F D D S S N V I L K K Y R N M V
1330 1340 1350 1360 1370 1380
GTCCGGGCCTGGCTGCCACTAGCTCCTCCGAGAATTAGACCCCTTGGGCCAAGTTT
V R A C G C H *
1390 1400 1410 1420 1430 1440
TTCTGGATCCTCCATTGCTCGCCTTGGCCAGGAACCAGCAGACCAACTGCCTTTGTGAG
1450 1460 1470 1480 1490 1500
ACCTTCCCCCTCCCTATCCCCAACTTTAAAGGTGTGAGAGTATTAGAACATGAGCAGCA
1510 1520 1530 1540 1550 1560
TATGGCTTTGATCAGTTTCAGTGGCAGCATCCAATGAACAAGATCCTACAGCTGTG
1570 1580 1590 1600 1610 1620
CAGGCAAAACCTAGCAGGAAAAAAACACGCATAAAGAAAAATGCCGGGCCAGGTCA
1630 1640 1650 1660 1670 1680
TTGGCTGGGAAGTCTCAGCCATGCACGGACTCGTTCCAGAGGTAAATTATGAGGCCCTAC
1690 1700 1710 1720 1730 1740
CAGCCAGGCCACCCAGCGTGGGAGGAAGGGGGCGTGGCAAGGGGTGGGCACATTGGTGT
1750 1760 1770 1780 1790 1800
CTGTGCAAGGAAAATTGACCCGGAAGTCCCTGTAATAATGTCACAATAAAACGAATG
1810 1820
AATGAAAAAAAAAAAAAA

FIG. 1B-2 OPI CDNA

CONSENSUS PROBE 20 30 40 50 60 70
 GATCTTAATGGGCTGTACGTGGACTTCCAGCGCAGCTGGCTGGGACTGGATCATCGCCCCCGTCG
 ** *
 TGTAAGAACGACGAGCTGTATGTCAGCTCCGAGACCTGGGCTGGCAGGACTGGATCATCGGCCCTGAAG
 OP I 28 38 48 58 68 78 88
 80 90 100 110 120 130 140
 ACTTCGACGCCACTACTGCTCCGGAGCCTGCCAGTTCCCTCTGCGGATCACTTAAACAGCACCAACCA
 **
 GCTACGCGCGCTACTACTGTGAGGGGGAGTGTGCCTCTGAACCTCCTACATGAACGCCACCAACCA
 98 108 118 128 138 148 158
 150 160 170 180 190 200 210
 CGCCGTGGTGCAGACCCCTGGTGAACAACATGAACCCCGGAAGGTACCCAAAGCCCTGCTGCGTGCCCCACC
 *
 CGCCATCGTGCAGACGCTGGTCCACTTCATCAACCCGGAAACGGTGCCAAGCCCTGCTGTGCGCCCCACG
 168 178 188 198 208 218 228
 220 230 240 250 260 270 280
 GAGCTGTCCGCCATCAGCATGCTGTACCTGGACGAGAATTCCACCGTGGTGTGAAGAACTACCAAGGAGA
 *
 CAGCTCAATGCCATCTCCGTCCCTACTTCGATGACAGCTCCAACGTCACTCTGAAGAAATACAGAAACA
 238 248 258 268 278 288 298
 290 300 310
 TGACCGTGGTGGGCTGCGGCTGCCGCTAACTGCA
 ** * * * * * * * * * * * * * * * *
 TGGTGGTCCGGGCTGTGGCTGCCACTAGCTCCT
 308 318 328

FIGURE 1C

17/422699

10 20 30 40 50 60
TCGACTCTAGAGTGTGTCAAGCACTGGCTGGGACTTCTGAACCTGCAGGGAGAATA
70 80 90 100 110 120
ACTTGCACCCCACTTGCGCCGGTGCCTTGCCCCAGCGGAGCCTGCTCGCCATCTC
130 140 150 160 170 180
CGAGCCCCACCGCCCTCCACTCCTCGGCCCTGCCGACACTGAGACGCTGTTCCCAGCG
190 200 210 220 230 240
TGAAAAGAGAGACTGCGCGGCCGGCACCCGGAGAAGGGAGGAGGAAAGAAAAGGAACGG
250 260 270 280 290 300
ACATTGCGTCTTGCGCAGGTCTTGACCAGAGTTTCCATGTGGACGCTTTCAA
310 320 330 340 350 360
TGGACGTGTCCCCCGCTGCTTCTTAGACGGACTGCGGTCTCTAAAGGTCGACCATGGTG
M V
370 380 390 400 410 420
GCCGGGACCCGCTGTCTTCTAGCGTTGCTGCTTCCCAGGTCTCTGGCGGCCGGCT
A G T R C L L A L L P Q V L L G G A A
430 440 450 460 470 480
GGCCTCGTCCGGAGCTGGGCCGCAGGAAGTTCGCGGCCGCTCGTGGGCCGCCCTCA
G L V P E L G R R K F A A A S S G R P S
490 500 510 520 530 540
TCCCAGCCCTCTGACGAGGTCTGAGCGAGTTCGAGTTGCGGCTGCTCAGCATGTTGGC
S Q P S D E V L S E F E L R L L S M F G
550 560 570 580 590 600
CTGAAACAGAGACCCACCCCCAGCAGGGACGCCGTGGTGGCCCTACATGCTAGACCTG
L K Q R P T P S R D A V V P P Y M L D L
610 620 630 640 650 660
TATCGCAGGCACTCGGGTCAGCCGGCTCACCCGCCAGACACCACCGGTTGGAGAGGGCA
Y R R H S G Q P G S P A P D H R L E R A
670 680 690 700 710 720
GCCAGCCGAGCCAACACTGTGCGCAGCTCCACCATGAAGAATCTTGAGAACACTACCA
A S R A N T V R S F H H E E S L E E L P
730 740 750 760 770 780
GAAACGAGTGGAAAACAACCCGGAGATTCTCTTTAATTAAAGTTCTATCCCCACGGAG
E T S G K T T R R F F F N L S S I P T E
790 800 810 820 830 840
GAGTTTATCACCTCAGCAGAGCTTCAGGTTTCCGAGAACAGATGCAAGATGCTTAGGA
E F I T S A E L Q V F R E Q M Q D A L G
850 860 870 880 890 900
AACAAATAGCAGTTCCATACCGAATTAAATTATGAAATCATAAAACCTGCAACAGCC
N N S S F H H R I N I Y E I I K P A T A
910 920 930 940 950 960
AACTCGAAATTCCCCGTGACCAGTCTTGGACACCAGGTTGGTAATCAGAATGCAAGC
N S K F P V T S L L D T R L V N Q N A S
970 980 990 1000 1010 1020
AGGTGGAAAGTTTGATGTCACCCCGCTGTGATGCGGTGGACTGCACAGGGACACGCC
R W E S F D V T P A V M R W T A Q G H A
1030 1040 1050 1060 1070 1080
AACCATGGATTCTGGTGGAAAGTGGCCACTTGGAGGAGAAACAAGGTGTCTCCAAGAGA
N H G F V V E V A H L E E K Q G V S K R

FIG. 2-1

17/422699

1090 1100 1110 1120 1130 1140
CATGTTAGGATAAGCAGGTCTTGACCCAAGATGAACACAGCTGGTCACAGATAAGGCCA
H V R I S R S L H Q D E H S W S Q I R P
1150 1160 1170 1180 1190 1200
TTGCTAGTAACTTTGGCCATGATGGAAAAGGGCATCCTCTCCACAAAAGAGAAAAACGT
L L V T F G H D G K G H P L H K R E::K R
1210 1220 1230 1240 1250 1260
CAAGCCAAACACAAACAGCGGAAACGCCCTAACGCTCAAGCTGTAAGAGACACCCTTGTAC
Q A K H K Q R K R L K S S C K R H P L Y
1270 1280 1290 1300 1310 1320
GTGGACTTCAGTGACGTGGGGTGGATGACTGGATTGTGGCTCCCCCGGGGTATCACGCC
V D F S D V G W N D W I V A P P G Y H A
1330 1340 1350 1360 1370 1380
TTTACTGCCACGGAGAACGCCCTTCTGGCTGATCATCTGAACCTCCACTAATCAT
F Y C H G E C P F P L A D H L N S T N H
1390 1400 1410 1420 1430 1440
GCCATTGTTAGACGGTGGTCAACTCTGTTAACCTAACGATTCTAACGGCATGCTGTGTC
A I V Q T L V N S V N S K I P K A C C V
1450 1460 1470 1480 1490 1500
CCGACAGAACTCAGTGCTATCTCGATGCTGTACCTGACGAGAACGAGTTGTATTAA
P T E L S A I S M L Y L D E N E K V V L
1510 1520 1530 1540 1550 1560
AAGAACTATCAGGACATGGTTGTGGAGGGTTGGGGTGTGCGCTAGTACAGCAAAATTAAA
K N Y Q D M V V E G C G C R *
1570 1580 1590
TACATAAAATATATATATATATATATTTAGAAAAAGAAAAAAA

FIG. 2-2

10	20	30	40	50	60
CTCTAGAGGGCAGAGGAGGGAGGGAGGGAAAGGAGCGCGGAGCCC GGCC GGAAGCTA					
70	80	90	100	110	120
GGTAGTGCGCATCGAGCTGAGGGACCGAGCGCTGAGACGCCGCTGCTGCCGGCTG					
130	140	150	160	170	180
AGTATCTAGCTGTCTCCCGATGGGATTCCCGTCCAAGCTATCTCGAGCCTGCAGCGCC					
190	200	210	220	230	240
ACAGTCCCCGGCCCTCGCCCAGGTTCACTGCAACC GTTCAAGGTCAGAGGTCCCAGGAGCTGCTG					
250	260	270	280	290	300
CTGGCGAGCCCGCTACTGCAGGGACCTATGGAGCCATTCCGTAGTGCCATCCCGAGCAAC					
310	320	330	340	350	360
GCACTGCTGCAGCTCCCTGAGCCTTCCAGCAAGTTGTTCAAGATTGGCTGTCAAGAA					
370	380	390	400	410	420
TCATGGACTGTTATTATGCTTGTTCGTCAAGACACCATGATT CCTGGTAACCGA					
		M I P G N R			
430	440	450	460	470	480
ATGCTGATGGTCGTTTATTATGCCAAGTCCTGCTAGGAGGCCGAGCCATGCTAGTTG					
M L M V V L L C Q V L L G G A S H A S L					
490	500	510	520	530	540
ATACCTGAGACGGGGAAAGAAAAAGTCGCCGAGATTCAAGGCCACGCCGGAGGAGCCGC					
I P E T G K K K V A E I Q G H A G G G R R					
550	560	570	580	590	600
TCAGGGCAGAGCCATGAGCTCCTGCGGGACTTCGAGGCAGACACTTCTGCAGATGTTGGG					
S G Q S H E L L R D F E A T L L Q M F G					
610	620	630	640	650	660
CTGGCGCCGCCGCCGCAGCCTAGCAAGAGTGGCGTATTCCGGACTACATGCCGGATCTT					
L R R R P Q P S K S A V I P D Y M R D L					
670	680	690	700	710	720
TACCGGCTTCAGTCTGGGGAGGAGGAGGAAGAGCAGATCCACAGCACTGGTCTTGAGTAT					
Y R L Q S G E E E E E Q I H S T G L E Y					
730	740	750	760	770	780
CCTGAGCGCCCGGCCAGCCGGCAACACCGTGAGGAGCTCCACCACGAAGAACATCTG					
P E R P A S R A N T V R S F H H E E H L					
790	800	810	820	830	840
GAGAACATCCCAGGGACCAAGTGAAA ACTCTGTTTCTGTTCTCTTTAACCTCAGCAGC					
E N I P G T S E N S A F R F L F N L S S					
850	860	870	880	890	900
ATCCCTGAGAACGAGGTGATCTCCTCTGCAGAGCTTCGGCTCTCCGGAGCAGGTGGAC					
I P E N E V I S S A E L R L F R E Q V D					
910	920	930	940	950	960
CAGGGCCCTGATTGGAAAGGGCTTCCACCGTATAAACATTATGAGGTTATGAAGCCC					
Q G P D W E R G F H R I N I Y E V M K P					
970	980	990	1000	1010	1020
CCAGCAGAAGTGGTGCCTGGCACCTCATCACAGACTACTGGACACAGAGACTGGCCAC					
P A E V V P G H L I T R L L D T R L V H					
1030	1040	1050	1060	1070	1080
CACAATGTGACACGGTGGAAACTTTGATGTGAGCCCTGCCGTCTCGCTGGACCCGG					
H N V T R W E T F D V S P A V L R W T R					
1090	1100	1110	1120	1130	1140
GAGAACGCAAACATGGCTAGCATTGAGGTGACTCACCTCCATCAGACTCGGACC					
E K Q P N Y G L A I E V T H L H Q T R T					

FIG. 3-1

1150	1160	1170	1180	1190	1200
CACCAAGGGGCCAAGCATGTCAGGATTAGCCGATCGTTACCTCAAGGGAGTGGGAATTGGGCC					
H Q G Q H V R I S R S L P Q' G S G N W A					
1210	1220	1230	1240	1250	1260
CAGCTCCGGCCCCCTCCTGGTCACCTTGCCATGATGGCCGGGGCATGCCTGACCCGA					
Q L R P L L V T F G H D G R G H A L T R					
1270	1280	1290	1300	1310	1320
CGCCGGAGGGCCAAGCGTAGCCCTAACATCACAGCGGGCCAGGAAGAAGATAAG					
R R R A::K R S P K H H S Q R A R K K N K					
1330	1340	1350	1360	1370	1380
AACTGCCGGGCCACTCGCTCTATGTGGACTTCAGCGATGTGGCTGGAATGACTGGATT					
N C R R H S L Y V D F S D V G W N D W I					
1390	1400	1410	1420	1430	1440
GTGGCCCCACCAGGCTACCAGGCCTTCACTGCCATGGGGACTGCCCTTCCACTGGCT					
V A P P G Y Q A F Y C H G D C P F P L A					
1450	1460	1470	1480	1490	1500
GACCACCTCAACTCAACCAACCATGCCATTGTGCAGACCCCTGGTCAATTCTGTCAATTCC					
D H L N S T N H A I V Q T L V N S V N S					
1510	1520	1530	1540	1550	1560
AGTATCCCCAAAGCCTGTTGTGCCACTGAACTGAGTGCATCTCATGCTGTACCTG					
S I P K A C C V P T E L S A I S M L Y L					
1570	1580	1590	1600	1610	1620
GATGAGTATGATAAGGTGGTACTGAAAAATTATCAGGAGATGGTAGTAGAGGGATGTGGG					
D E Y D K V V L K N Y Q E M V V E G C G					
1630	1640	1650	1660	1670	1680
TGCCGCTGAGATCAGGCAGTCCTTGAGGATAGACAGATATACACACACACACACAC					
C R *					
1690	1700	1710	1720	1730	1740
CACATACACCACACACACACGTTCCCATCCACTCACCCACACACTACACAGACTGCTTCC					
1750	1760	1770	1780	1790	1800
TTATAGATGGACTTTATTTAAAAAAAAAAAAAAAAATGGAAAAATCCCTAAACATT					
1810	1820	1830	1840	1850	1860
CACCTTGACCTTATTTATGACTTACGTGCAAATGTTTGACCATATTGATCATATATT					
1870	1880	1890	1900	1910	1920
TGACAAAATATTTATAACTACGTATTAAGAAAAAATAAAATGAGTCATTATTTA					
1930					
AAAAAAAAAAAAAAA					

FIG. 3-2

APPROVED BY	O.G. FIG.
CLASS	SUBCLASS
DRAFTSMAN	

07/06/62
810,560

GGAGGTATAGGAGCTCTTCGATTTAGCAAACCAGGAGTCCGAAGATCTAAGGAGAGC
TGGGGTTTACTCCAGAGCTCGAGCAGTCCCAAGACCTGGTCTTGACTCACAGGTTA
GACTCCACTCAGAGGCTACTGTCTCCAGGGTCTACACCTCTAACGGCGACACTGGGCTC
AACAGACTGCCGTTCTATGGATGAGCCTCACAGGGCAGCAGTTGGATGGT
TGAGGTTGGCTGTAGACATCAGAAACCAAGTCAAATGCCTCAACCAGTAGAAAATT
CACAGCCCGAGAGCTAAGGTTGGTGGACATTAGGTTGGTGTACCTCAGTGTGCTTCCTC
AGTGTCTCTGAGCCCCAGCTCCTCTGCCCCACCCACATCTCAGTGTGCTTCCTC
TCAAGGCACAGCTGTAGTGGCCAGGGGGCTCATTTTGCTCCTGGCAGTAG
GAGGAAGAGAATGAATGTCTCTCATGGTCTTCTTAGGAATGTGGAAACTTTTCCAG
AAGTCTATGTCTTTAGTTGTGGTCACTTGCCTCTGAACCACCTTCCTGAC
TCTGGACAGGATGTGCACTGATGAGCTTAGCTTGGGGATCTAATAGTGTGACTTACAAA
GCCCTTTGAGAAGGTGACATTGAAACCAAGGCTTGAGCAGACACAACAAAGATTGAGG
GAGGGCATTGAGGTGGAGGAAACGGCACATGCAAGAGCCCTGCGTGGGAGTGAGCTG
GTGTTGGTCAATCAGTTGTCAAGACACCCGGCCCTGTCAGCAGGCACAGCCTGGCC
TGCTCTGAGTATGACAGAGAGCCCCCTGGGAAGTTGTAGGGAGGAAGACAGGTATGA
CTAGGAAAAAAAGCAATCCCTCTGTTGGGGTGGAGGAAGGGTGCAGTGTGTGAGAG
AGAGACAAGACAGACAGACAGACACTCTCAATTTACAAGTGTCAAGGCCCCTGACCC
AATGCTCCAATTACGTAGTTCTGAAAACCCCTGTATCATTTCACTACTCAAAGA
AACCTCGGGAGTGTCTCTGAAAGGTATCAGGTTGACTCTGCTGTCTCATTT
CTTCTGCTGGTGGTGTGATGGTGTCTGCTCCAGGCCCTGCCCCATCCTCTGCC
CTGCAGAGGGATGAGTGTGTTGGGCCCTACGAGTTGAGGTTGTTATAAGCAGATCT
TTGAGCAGGGCGCTGCACTGGCCTGTGAGGCTGGAGGGTTGATTCCTTATGG
AATCCAGGCAGATGTAGCATTTAAACAACACACGTGTATAAAAGAAACCAGTGTCCGCAG
AAGGTTCCAGAAAGTATTATGGGATAAGACTACATGAGAGAGGAATGGGCATTGGCACC
TCCCTAGTAGGGCTTGTGGGGTAGAAATGAGTTAAGGCAGGTTAGACCCCTGGA
ACTGGCTTTGAATCGGAAATTACCCCCCAGCCGTTGTCTGCTTCATTGCTGTTACA
TCACTGCCTAAGATGGAGGAACCTTGATGTGTGTTCTTCTCCTCACTGGCTCT
GCTCTTCACTCCTGTCAAT

;intron=exon

GCAGAGAACAGCAGCAGCGACCAGAGGCAGGCCCTGTA

A	E	N	S	S	S	D	Q	R	Q	A	C			
K	K	H	E	L	Y	V	S	F	R	D	L	G	W	Q

;exon=intron

GTCGTCTGGGTGTGGGCCCTCTGGCGTGGCTCCCACAGGCAGCGGGTGCTGTGCTCA
GTCTTGTCTCATCTGCCAGTTAACACTCCAGTATCAAGTGGCCTCGCTAGGGAAAG
GTACTGGCTAAGGATACAGG.....
.GGAGCCAGCATGGGTGACGCCATTAGGTTATTAGCCTCTCTGGCAGGTGGGAAAC
CGAGGCATGGAGTTGTTAACGGTAAGTCCAGTGTGACCCACCTAGTGGGTAGAG
CTGATGATTGCTCACACCGGAGCTCTCTGTGCGCGTTCTGTCCAGAACACAGC
CATGGATGTCCATTAGGATCAGCCAAGCCCCCTCTGTCTTCATTTTATTATGT
TTTTTAGAAATGGGTCTTGCTCTGTCACCCAGGCTGGGTGCAGTGGTGTATCATAGC
TCACCGCAGCTTGACGCCGCTTCCACTCAGTCTACTAACGTTGGACTATAGGCCAG
ACTATAGAGTGGCTCTCTTCCATTCTTGGGACCATGAGAGGCCACCCATGTTCT
GCCCTGCTGGGCCCTGCTGCTCAGAAGGCATGGTCTGAGGCTTCAACCTGGTGTGAG
CCTCGTGGTGGTTCTTCAGCATGGGTGGGATGCTGTGCTCAGGCTCTGCATGGT
TTCCACACTCTCTCCTCAG

;intron=exon

FIG. 1A-1

APPROVED	J.G. FIG.
BY	CLASS
DRAFTSMAN	

07/66/62
810,560

GACTGGATCATCGCCGCTGAAGGCTACGCCGCCT
 D W I I A P E G Y A A
 ACTACTGTGAGGGGGACTGTGCCTTCCCTCTGAACCTCCTACATGAACGCCACCAACCACG
 Y Y C E G E C A F P L N S Y M N A T N H
 CCATCGTGCAGACGCTG
 A I V Q T L
;exon=intron

GTGGGTGTACGCCATCTGGGTGTGGTCACCTGGCCGGC
 AGGCTGCCGGGCCACCAAGATCCCTGCTGCCCTCCAAGCTGGGGCTGAGTAGATGTCAGGCC
 ATTGCCATGTCATGACTTTGGGGCCCTTGCGCGTTAAAAAAATCAAAAATTGTA
 CTTATGACTGGTTGGTAAAGAGGAGTATAATCTCGACCCCTGGAGTTATT
 CTCTAATTTAAAGTAACAAAGGGTGTATGGGCTCTTGAGGATGCTTGTAGTATT
 GTGGGTGCTGGTTACGGTGCCTAACAGGACTGGGCCCTGCTCATTTCAGTAGAGGA
 AACAGGTAAACAGATGAGAAATTCACTGAGGGCACAGTGATCAGAACGGGCCAGCAG
 GATAATGGGATGGAGAGATGAGTGGGACCCATGGCCATTCAAGTAAATTTCAGTCG
 GGTACCAAGGAAGATTCCATGTGATAATGAGATTAACGTGCCAGTCAGGCCACACTCA
 GTAGGTGTTATTCTGCTTGCAACAGCAACCATAGTTGATAAGAGCTGTTAGGGATT
 TGCCCTTTGCTTAGAATCCAAGGTCAAGGACCTGGTTATGTAGCTCCCTGTCATGAA
 CATCATGAGCCTTCCCTGCCTACTGATCATCCACCCCTGCCCTGAATGCTTCTAGTGAC
 AGAGAGCTCACTACCAAGGACTACTCCCTCCCTCATTTAGTAATCTGCCCTCTTCTT
 TTGCTCTTGAGGGCAGGGTTTTGTTGTTTTAAGTGTGGTTTC
 CAAAGCCCTTGCTCCCCCTCAATTGAAACTTCAAAGCCTCATTGGGATTGAAGGTCC
 TAGGCTGAAACAGAAGAGTCCTCCCCAACCTGTTCCCTGGCTGGATGTGCTGCTG
 TGCAGTATCCCCTGAAAGTGCAGGATGCTCTCCCTGGCAGACATCTCT
 ATCCCTCTCCAACCCCTGCCCTCATGGCCCATGGAACAGGAGTGCCTACGCCCTGTC
 ACCTACTTCCATCAGTATTTCACCAAGAGATCTGCAGGATCAAAGTGAATTCTCCAGGGAT
 TGTGAAATGATGCGATTGTTGCTATGTTAAAAGGGGCAACTGTCTTAGAGAGTCCT
 GATGAAATGCTTCAGAGGAATGAGCTGATGGCTGGAATTGCTTAAAATCATCAAG
 GTGGAGCAGGTGGGAAGGGTATGGATGTAAGAGTTGAAATTGTCATCATAAAATG
 TGTAAAAGCATGCTGGCTATGTCAGCAGTCAGCCTGGAGGTGTTAACAGAGTGC
 GTCACTGATGTCAGGCTGGCACCTACAGTGTGGAAACCCAGAACAGTTCACGTTGAA
 AACACAGGACAGTGGAACTCTGGCCCTGTCTGAACACGTGGCAGATCTGCTAACACT
 GATCTGGTTGGCTGCCGTCAAGCTTAGGTTGAGTGGCGGCTTCCCTAGTTGCTTAGT
 CCCCTCTATTCCCTATTGCTTACCTCGGTCTATTGCTATTCAGTGGACCTCACGAGG
 CACTCATAGGCATTGAGCTATGTCAGGCTGGCCACATCCTCTGTAAGGTGAGAAC
 GTCCATGAGCAAGATGGAGCACTCTAGTGGTCCAGTCAGGAGACATATTCAAGCACT
 TACAGTGCACAGGGCAGTCCCCAACAGAGAACACTGTCAGGCTGGGATCTGGC
 CCCTCCCTCCCCACTGTATAATGAAAACCTCTATGCTTGTCCCCCTGTCAGGAGAAC
 ACAGGGATAATCCCAGAACTGAGTTGTCATGAAAGTGTAGAACACAGGGAGTGTG
 CTTGGGAGTGTGTCACCTGCAGTCATTGCTTACAGGATGTTCTTATAGAAA
 CGTGGAGGCCAGTTAGAACGACTCACCGCTCTACCACTGCCATGTTGGTGTG
;intron=exon

GTCCACTTCATCAACCCGGAAACGGTGCCCAAGCCCTGCTGTGCCGCCACGCAGC
 V H F I N P E T V P K P C C A P T Q
 TCAATGCCATCTCCGTCTACTTCGATGACAGCTCCAACGTCTGAAGAAATACA
 L N A I S V L Y F D D S S N V I L K K Y
 GAAACATGGTGGTCCGGGCTGTGGCTGCCACTAGCTCCCGAGAACAGGGAGTGTG
 R N M V V R A C G C H

FIG. 1A-2

APPROVED	O.G. FIG.
BY	CLASS SUBCLASS
DRAFTSMAN	

07/660,162
810,560

10	20	30	40	50	60		
GGTGCGGGCCGGAGCCCGGAGCCCCTGGTAGCGCTAGAGCCGGCGCATGCACTGTGCGC				M H V R			
S L R A A A P H S F V A L W A P L F L L	70	80	90	100	110	120	
CGCTCCGCCCTGGCCGACTTCAGCCTGGACAACGGAGGTGCACTCGAGGCTTCATCCACCGG	130	140	150	160	170	180	
R S A L A D F S L D N E V H S S F I H R	- - - -						
CGCCTCCGAGCCAGGAGCGGGAGATGCAAGCAGCGAGATCCTCTCCATTGGCTTG	190	200	210	220	230	240	
R L R S Q E R R E M Q R E I L S I L G L	250	260	270	280	290	300	
CCCCACCGCCCGGCCGCACCTCCAGGGCAAGCACAACTCGGCACCCATGTTCATGCTG	310	320	330	340	350	360	
GACCTGTACAACGCCATGGCGGTGGAGGAGGGCGGGGGGGGGCGGCCAGGGCTTC	D L Y N A M A V E E G G G G P G G G Q G F S	370	380	390	400	410	420
TACCCCTACAAGGCCGTCTCAGTACCCAGGGCCCCCTCTGGCCAGCCTGCAAGATAGC	Y P Y K A V F S T Q G P P L A S L Q D S	430	440	450	460	470	480
CATTTCTCACCGACGCCGACATGGTCATGAGCTTCGTCAACCTCGTGGAACATGACAAG	H F L T D A D M V M S F V N L V E H D K	490	500	510	520	530	540
GAATTCTCACCCACGCTACCACCATCGAGAGTTCCGGTTGATCTTCCAAGATCCA	E F F H P R Y H H R E F R F D L S K I P	550	560	570	580	590	600
GAAGGGGAAGCTGTCACGGCAGCCGAATCCGGATCTACAAGGACTACATCCGGAACGC	E G E A V T A A E F R I Y K D Y I R E R	610	620	630	640	650	660
TTCGACAATGAGACGTTCCGGATCAGCGTTATCAGGTGCTCCAGGAGCACTGGCAGG	F D N E T F R I S V Y Q V L Q E H L G R	670	680	690	700	710	720
GAATCGGATCTCTCTGCTCGACAGCGTACCCCTGGGCTCGGAGGAGGGCTGGCTG	E S D L F L L D S R T L W A S E E G W L	730	740	750	760	770	780
GTGTTTGACATCACAGGCCACAGCAACCACTGGGTGGTCATCCGCGGACAACCTGGC	V F D I T A T S N H W V V N P R H N L G	790	800	810	820	830	840
CTCGAGCTCTGGAGACGCTGGATGGGAGAGACATCAACCCCAAGTGGCGGGCTG	L Q L S V E T L D G Q S I N P K L A G L	850	860	870	880	890	900
ATTGGCCGGCACGGCCCCAGAACAAAGCAGCCCTCATGGTGGCTTCTCAAGGCCACG	I G R H G P Q N K Q P F M V A F F K A T	910	920	930	940	950	960
GAGGTCCACTTCCGAGCATCCGGTCCACGGGAGCAACAGCGCAGCCAGAACCGCTCC	E V H F R S I R S T G S K Q R S Q N R S	970	980	990	1000	1010	1020
AAGACGCCCAAGAACCGAGGAAGCCCTGCGGATGGCAAACGTGGCAGAGAACAGCAGCAGC	* * * * *						
K T P K N Q E A L R M A N V A E N S S S	*	*	*	*	*	*	

FIG. 1B-1 OP1 cDNA

APPROVED	O.G. FIG.
BY	CL/93 SUBCLASS
DRAFTSMAN	

07/6/1982
810,560

1030 1040 1050 1060 1070 1080
 GACCGAGGGCAGGCCCTGTAAGAACGACGAGCTGTATGTCAGCTTCCGAGACCTGGGCTGG
 D Q R Q A C K K H E L Y V S F R D L G W
 1090 1100 1110 1120 1130 1140
 CAGGACTGGATCATCGCGCTGAAGGCTACGCCCTACTACTGTGAGGGGGAGTGTGCC
 Q D W I I A P E G Y A A Y Y C E G E C A
 1150 1160 1170 1180 1190 1200
 TTCCCTCTGAACCTCATGAACGCCACCAACCACGCCATCGTGCAGACGCTGGTCCAC
 F P L N S Y M N A T N H A I V Q T L V H
 1210 1220 1230 1240 1250 1260
 TTCATCAACCCGGAAACGGTGCCCAAGCCCTGCTGTGCCCCACGCAGCTCAATGCCATC
 F I N P E T V P K P C C A P T Q L N A I
 1270 1280 1290 1300 1310 1320
 TCCGTCCCTACTTCGATGACAGCTCCAACGTCATCCTGAAGAAAATACAGAAAATGGT
 S V L Y F D D S S N V I L K K Y R N M V
 1330 1340 1350 1360 1370 1380
 GTCCGGGCCCTGTGGCTGCCACTAGCTCCGCCAGAATTAGACCCTTGGGCCAAGTT
 V R A C G C H *
 1390 1400 1410 1420 1430 1440
 TTCTGGATCCTCCATTGCTCGCCTGGCCAGGAACCAGCAGACCAAATGCCTTTGTGAG
 1450 1460 1470 1480 1490 1500
 ACCTTCCCCTCCCTATCCCCAACTTTAAAGGTGTGAGAGTATTAGGAAACATGAGCAGCA
 1510 1520 1530 1540 1550 1560
 TATGGCTTTGATCAGTTTCAGTGGCAGCATCCAATGAACAAGATCCTACAAGCTGTG
 1570 1580 1590 1600 1610 1620
 CAGGCAAAACCTAGCAGGAAAAAAACAAACGCATAAAGAAAAATGCCGGGCCAGGTCA
 1630 1640 1650 1660 1670 1680
 TTGGCTGGGAAAGTCTCAGCCATGCACGGACTGTTCCAGAGGTAATTATGAGCGCCTAC
 1690 1700 1710 1720 1730 1740
 CAGCCAGGCACCCAGCCGTGGAGGAAGGGGGCGTGGCAAGGGGTGGCACATTGGTGT
 1750 1760 1770 1780 1790 1800
 CTGTGCGAAAGGAAAATTGACCCGGAAGTCTGTAAATGTACAATAAACGAATG
 1810 1820
 AATGAAAAAAAAAAAAAA

FIG. 1B-2 OPL CDNA

APPROVED	D.G. FIG.
BY	CL/SS SUBCLASS
BRAFTHAM	

07/660162
810,560

CONSENSUS PROBE 20 30 40 50 60 70
 GATCCTAATGGGCTGTACGTGGACTTCCAGCGCGACGTGGCTGGGACGACTGGATCATCGCCCCCGTCG
 *
 TGTAAAGAACGACGAGCTGTATGTCAGCTCCGAGACCTGGCTGGCAGGACTGGATCATCGGCCTGAAG
 OP 1 28 38 48 58 68 78 88
 80 90 100 110 120 130 140
 ACTTCGACGCCCTACTACTGCTCCGGAGCCTGCCAGTTCCCTCTGCGGATCACTTCAACAGCACCAACCA
 *
 GCTACGCGCCTACTACTGTGAGGGGGAGTGTGCCTCCCTCTGAACTCCTACATGAACGCCACCAACCA
 98 108 118 128 138 148 158
 150 160 170 180 190 200 210
 CGCCGTGGTGCAGACCCCTGGTGAACAACATGAACCCCCGGCAAGGTACCCAAGGCCCTGCTGCGTGCCACC
 *
 CGCCATCGTGCAGACGCTGGTCCACTTCATCAACCCGGAAACGGTGCCCAAGGCCCTGCTGTGCGCCACG
 168 178 188 198 208 218 228
 220 230 240 250 260 270 280
 GAGCTGTCCGCCATCAGCATGCTGTACCTGGGACGAGAATTCCACCGTGGTGTGAAGAACTACCAAGGAGA
 *
 CAGCTCAATGCCATCTCCGTCCACTTCGATGACAGCTCAACGTCACTCTGAAGAAAATACAGAAACA
 238 248 258 268 278 288 298
 290 300 310
 TGACCCGTGGTGGGCTGCGGCTGCCGCTAACGTCA
 *
 TGGTGGTCCGGGCTGTGGCTGCCACTAGCTCCT
 308 318 328

FIGURE 1C

APPROVED	O.G. FIG.
BY	CLASS SUBCLASS
DRAFTERMAN	

07/6/1962
810,560

M V

10 20 30 40 50 60
 TCGACTCTAGAGTGTGTCA GC ACTTGGCTGGGACTTCTGA CT TG CAGGGAGAATA
 70 80 90 100 110 120
 ACTTGCGCACCCCACTTGC GCGCGGTGCCTTGC CCCAGCGGAGCCTGCTCGCCATCTC
 130 140 150 160 170 180
 CGAGCCCCACCGCCCCTCACTCCTCGGCCTTGCCCCGACACTGAGACGCTGTTCCCAGCG
 190 200 210 220 230 240
 TGAAAAGAGAGACTGCGCGCCGGCACCCGGAGAAGGAGGAGGCAAAGAAAAGGAACGG
 250 260 270 280 290 300
 ACATTGGTCCTTGCGCCAGGTCTTGACCAGAGTTTCCATGTGGACGCTCTTCAA
 310 320 330 340 350 360
 TGGACGTGTCCCCCGTGCTTCTTAGACGGACTGCGTCTCCTAAAGGTGACCATGGTG

 370 380 390 400 410 420
 GCCGGGACCCGCTGTCTCTAGCGTTGCTGCTCCCCAGGTCTCGGGCGCGCGCT
 A G T R C L L A L L P Q V L L G G A A
 430 440 450 460 470 480
 GGCCTCGTCCGGAGCTGGGCCGCAGGAAGTTCGCGCGCGTCGTGGGCCGCCCTCA
 G L V P E L G R R K F A A A S S G R P S
 490 500 510 520 530 540
 TCCCAGCCCTCTGACGGAGCTTGAGCGAGTTCGAGTTGGGCTGCTCAGCATGTTCGGC
 S Q P S D E V L S E F E L R L L S M F G
 550 560 570 580 590 600
 CTGAAACAGAGACCCACCCCAAGCAGGGACGCCGTGGTGGCCCTACATGCTAGACCTG
 L K Q R P T P S R D A V V P P Y M L D L
 610 620 630 640 650 660
 TATCGCAGGCACTCGGGTCAGCGGGCTCACCGCCCAAGACCAACCGGTTGGAGAGGGCA
 Y R R H S G Q P G S P A P D H R L E R A
 670 680 690 700 710 720
 GCCAGCCGAGCCAACACTGTGCGCAGCTTCCACCATGAAGAATCTTGAAGAACTACCA
 A S R A N T V R S F H H E E S L E E L P
 730 740 750 760 770 780
 GAAACGAGTGGAAAACAACCCGGAGATTCTCTTTAATTAAAGTTCTATCCCCACGGAG
 E T S G K T T R R F F F N L S S I P T E
 790 800 810 820 830 840
 GAGTTTATCACCTCAGCAGAGCTTCAGGTTCCGAGAACAGATGCAAGATGCTTAGGA
 E F I T S A E L Q V F R E Q M Q D A L G
 850 860 870 880 890 900
 AACCAATAGCAGTTCCATACCGAATTAAATTATGAAATCATAAAACCTGCAACAGCC
 N N S S F H H R I N I Y E I I K P A T A
 910 920 930 940 950 960
 AACTCGAAATCCCCGTGACCACTCTTGGACACCAGGTGGTAATCAGAATGCAAGC
 N S K F P V T S L L D T R L V N Q N A S
 970 980 990 1000 1010 1020
 AGGTGGGAAAGTTTGATGTCACCCCGCTGTGATGCGGTGGACTGCACAGGGACACGCC
 R W E S F D V T P A V M R W T A Q G H A
 1030 1040 1050 1060 1070 1080
 AACCATGGATTCTGGTGGAGTGGCCACTTGGAGGAGAACAAAGGTGTCTCCAAGAGA
 N H G F V V E V A H L E E K Q G V S K R

FIG. 2-1

APPROVED	O.G. FIG.
BY	CLASS 303 CLASS
DRAFTSMAN	

07/66
810,560

1090 1100 1110 1120 1130 1140
 CATGTTAGGATAAGCAGGTCTTGACCAAGATGAACACAGCTGGTCACAGATAAGGCCA
 H V R I S R S L H Q D E H S W S Q I R P
 1150 1160 1170 1180 1190 1200
 TTGCTAGTAACCTTGGCCATGATGGAAAAGGGCATCCTCTCCACAAAGAGAAAAACGT
 L L V T F G H D G K G H P L H K R E : K R
 1210 1220 1230 1240 1250 1260
 CAAGCCAAACACAAACAGCGGAAACGCCTTAAGTCCAGCTGTAAGAGACACCCTTGAC
 Q A K H K Q R K R L K S S C K R H P L Y
 1270 1280 1290 1300 1310 1320
 GTGGACTTCAGTGACGGGGTGGAAATGACTGGATTGTGGCTCCCCCGGGGTATCACGCC
 V D F S D V G W N D W I V A P P G Y H A
 1330 1340 1350 1360 1370 1380
 TTTTACTGCCACGGAGAATGCCCTTCCCTGGCTGATCATCTGAACCTCCACTAATCAT
 F Y C H G E C P F P L A D H L N S T N H
 1390 1400 1410 1420 1430 1440
 GCCATTGTTCAGACGTTGGTCAACTCTGTTAACCTCAAGATTCTAACGGCATGCTGTGTC
 A I V Q T L V N S V N S K I P K A C C V
 1450 1460 1470 1480 1490 1500
 CCGACAGAACTCAGTGCTATCTCGATGCTGTACCTTGACGAGAATGAAAAGGTTGATT
 P T E L S A I S M L Y L D E N E K V V L
 1510 1520 1530 1540 1550 1560
 AAGAACTATCAGGACATGGTTGTGGAGGGTTGGGGTGTGCTAGTACAGCAAATTAAA
 K N Y Q D M V V E G C G C R *
 1570 1580 1590
 TACATAAAATATATATATATATATTTAGAAAAAGAAAAAAA

FIG. 2-2

APPROVED	C.I.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

~~07/660,162~~
810,560

FIG. 3-1

APPROVED	ORG. FIG.
BY	SUBCLASS
RAFTSMAN	

07/6076
810,560

1150	1160	1170	1180	1190	1200
CACCA	GGGCC	CAGCAT	GTCAGGATTAGCCGATCGTTACCTCAAGGGAGTGGGAATTGGGCC		
H Q G	Q H V	R I S R S	L P Q' G S G N W A		
1210	1220	1230	1240	1250	1260
CAGCT	CCGGCCCCCTCCTGGTCACCTTGCCATGATGGCCGGGCCATGCCTTGACCGA				
Q L R P L	L V T F G H D G R G H A L T R				
1270	1280	1290	1300	1310	1320
CGCCGGAGGGCCAAGCGTAGCCCTAACATCACTCACAGCGGGCCAGGAAGAAGAATAAG					
R R R A::K	R S P K H H S Q R A R K K N K				
1330	1340	1350	1360	1370	1380
AACTGCCGGCGCCACTCGCTCTATGTGGACTTCAGCGATGTGGCTGGAATGACTGGATT					
N C R R H S L Y V D F S D V G W N D W I					
1390	1400	1410	1420	1430	1440
GTGGCCCCACCCAGGCTACCAGGCCTCTACTGCCATGGGACTGCCCTTCCACTGGCT					
V A P P G Y Q A F Y C H G D C P F P L A					
1450	1460	1470	1480	1490	1500
GACCACCTCAACTCAACCAACCATGCCATTGTGCAGACCCCTGGTCAATTCTGTCAATTCC					
D H L N S T N H A I V Q T L V N S V N S					
1510	1520	1530	1540	1550	1560
AGTATCCCCAAAGCCTGTGTGCCCCTGAACACTGAGTGCATCTCCATGCTGTACCTG					
S I P K A C C V P T E L S A I S M L Y L					
1570	1580	1590	1600	1610	1620
GATGAGTATGATAAGGTGGTACTGAAAAATTATCAGGAGATGGTAGAGGGATGTGGG					
D E Y D K V V L K N Y Q E M V V E G C G					
1630	1640	1650	1660	1670	1680
TGCCGCTGAGATCAGGCAGTCCTTGAGGATAGACAGATATACACACACACACACACAC					
C R *					
1690	1700	1710	1720	1730	1740
CACATACACCAACACACACAGTTCCCATCCACTCACCCACACACTACACAGACTGCTTCC					
1750	1760	1770	1780	1790	1800
TTATAGATGGACTTTATTTAAAAAAAAAAAAAAAAAATGGAAAAAATCCCTAAACATT					
1810	1820	1830	1840	1850	1860
CACCTTGACCTTATTTATGACTTTACGTGCAAATGTTTGACCATATTGATCATATATT					
1870	1880	1890	1900	1910	1920
TGACAAAATATTTATAACTACGTATTAAGAAAAAAATAAATGAGTCATTATTTA					
1930					
AAAAAAAAAAAAAAA					

FIG. 3-2